

ICTS Astrophysics & Relativity Seminar

- Title** : Astrometric Analysis of Dark Matter Subhalos in Galaxy Clusters: Highly Magnified Image Pairs as Probes of Critical Curve Perturbations
- Speaker** : Joaquin Becerra Espinoza (University of California, USA)
- Date** : Thursday, 22nd August 2024
- Time** : 3:30 PM (IST)
- Abstract** : Strong gravitational lensing in galaxy clusters offers a unique method to probe dark matter subhalos by analyzing perturbations to critical curves. This ongoing study focuses on the astrometric shifts in highly magnified, symmetric image pairs of background stars caused by subhalos near the critical curve. In a smooth lensing model, these image pairs align symmetrically with respect to a flat critical curve, but the presence of subhalos induces detectable shifts, disrupting it into a "wiggling" pattern. By comparing observed deviations with theoretical models, we infer subhalo properties, with early results showing sensitivity to subhalos in the mass range of one to hundreds of millions of solar masses. These astrometric signatures, detectable by instruments like the James Webb Space Telescope, provide a powerful tool for constraining dark matter substructure in galaxy clusters.
- Venue** : Feynman Lecture Hall
- Zoom Link: <https://icts-res-in.zoom.us/j/91610121218?pwd=RwrxcE7fmbHdY6tGMNdjHYbUDgmexZ.1>
- Meeting ID: 916 1012 1218
- Passcode: 202030